Australia.—In Queensland * * * the month was one of drought.[1]

Guam.—AGANA, March 30.—A typhoon of moderate intensity struck the island of Guam last Saturday, raged four days and receded without causing loss of life, but leaving property damage estimated at $200,000.—*New York World, March 31, 1923.*

Argentina.—In Buenos Aires the unusually high March temperature of 94° F. recorded on the 12th, was followed by a fall of 36° F. in 12 hours. Pressure rose 5 mb. almost instantly.[1]

Brazil.— * * * In the north the rainfall averaged 53 mm. below normal. In the center the distribution was irregular; in the south the fall averaged 100 mm. above normal, the excess being greatest in the extreme south. * * * There is still an absence of intense anticyclones and the general circulation presents no unusual features.[1]

DETAILS OF THE WEATHER IN THE UNITED STATES.

GENERAL CONDITIONS.

ALFRED J. HENRY.

The single outstanding feature of the month was the steady march of anticyclonic areas from the Pacific, some of which entered the continent north of the mouth of the Columbia and others as far south as the middle California coast.

As a direct result of this movement, drought prevailed in the Pacific Coast States, also in the Plateau region, the northern Rocky Mountains, and the upper portions of the Missouri and Mississippi Valleys; the most striking result, however, was the unseasonable temperatures recorded in many parts of the country due to the transportation of cold air from higher latitudes. Details appear in subsequent pages.

CYCLONES AND ANTICYCLONES.

By W. P. DAY.

March, in contrast to the preceding month, showed greatly increased barometric activity, a rapid succession of cyclones and anticyclones passing within the range of observation. Twenty low-pressure areas were noted and tracked, nine of which were of the Alberta type (Alaskan or North Pacific cyclones coming into the field of observation from Alberta), but the more important storms began as secondary developments over the south or southwest and several attained major intensity.

Thirteen high-pressure areas—anticyclones—were observed and these incursions of denser air were quite important as cold waves in several instances. The cold-wave types are usually masses of cold air loosed from the cold polar cap which advance southward over Canada when pressure conditions in the United States are favorable. Anticyclones moving in from the Pacific do not bring marked changes to colder.

FREE-AIR SUMMARY.

By L. T. SAMUELS, Meteorologist.

The general characteristics of the average free-air conditions for the month as a whole showed remarkably close agreement with those for February, 1923, with respect to departures from normal. Thus it will be observed in Table 1 that the temperature departures were all negative except in the upper levels at Groesbeck, a condition identical with that found last month. The persistence of large departures with increase in altitude was likewise most pronounced at the northern stations.

The vapor pressure departures conformed regularly with those for temperature and the relative humidity averaged in general somewhat less than the normal in the lower levels and above in the upper levels, although practically all the departures were less than 10 per cent.

At each of the six kite stations minimum March temperature records were exceeded at various upper levels. These low temperatures were observed as a rule during the prevalence of severe cold wave conditions, a number of which occurred during the month.

In Table 2 are shown the resultant wind velocities and directions for the month and their normal values. A striking feature observed in the table is the high resultant velocities for the month at all stations except Broken Arrow and Groesbeck. The usual connection found between the resultant wind direction and the temperature departures is especially well illustrated. At Drexel and Ellendale where negative temperature departures were greatest the north component is found to exceed the normal by an appreciable amount. At Royal Center, Broken Arrow, and Due West the south component is decidedly less than normal while at Groesbeck, where negative temperature departures occurred in the lower levels and positive departures in the upper levels, the south component was less than normal in the former but exceeded it in the latter.

High winds were frequent during the month, there being more than twice as many observed velocities of 40 meters per second or more as occurred during March, 1922. These were observed by means of pilot balloons and are given in the following table:

Station.	Date.	Velocity.	Direction.	Altitude.
		m. p. s.		*m.*
Camp Alfred Vail, N. J.	16	47	wsw.	500
Camp Benning, Ga.	7	43	w.	5,000
Do.	9	41	wnw.	6,800
Do.	14	46	w.	7,200
Bolling Field, D. C.	10	41	sw.	1,400
Fort Bragg, N. C.	7	50	w.	3,500
Broken Arrow, Okla.	7	61	w.	6,500
Fort Curtis, Va.	14	42	nw.	3,200
Drexel, Nebr.	5	40	wsw.	1,400
Ellendale, N. Dak.	27	54	wnw.	4,000
Groesbeck, Tex.	13	46	w.	4,400
Do.	24	46	wsw.	9,500
Kelly Field, Tex.	11	40	w.	1,400
Lansing, Mich.	27	42	wnw.	2,250
Camp Lewis, Wash.	19	60	wsw.	2,000
Fort Riley, Kan.	26	45	w.	6,700

In order to verify the high velocities recorded at Ellendale on the 27th and at Groesbeck on the 13th, a second observation was made immediately after the first at both of these stations and the results found were substantially the same, thereby adding to the confidence which may generally be placed in single theodolite observations even in high winds.

The observation at Camp Alfred Vail on the 16th is cited because of the abnormally rapid increase in the wind speed at a comparatively short distance above the surface. The recorded velocities indicated a surface wind of but 9 meters per second overrun by a gale of 47

[1] *Meteorological Magazine*, April 1923, pp. 68-69.

[1] *Meteorological Magazine*, April 1923, pp. 68-69.